

IN THE SPECIFICATION:

Please replace paragraph [0039] with the following amended paragraph:

[0039] Fig. 1 is an explanatory view schematically showing an example of an ion implantation system of the present invention. The system shown in Fig. 1 comprises an ion extraction assembly 100 which includes an arc discharge ion source 5, a cylinder 17 for supplying predetermined gas to the ion source 5 and a pair of extraction electrodes 8 and 9; an ion mass selector 130; and a target substrate ~~holder~~ holder 140.

Please replace paragraph [0049] with the following amended paragraph:

[0049] Returning to Fig. 1, the ion beam IB from the ion extraction assembly 100 is directed to the target substrate ~~holder~~ holder 140 through the ion mass selector 130.

Please replace paragraph [0051] with the following amended paragraph:

[0051] Then, predetermined ions with a mass number 20 or lower are selected from the ion beam IB passing through the ion mass selector 130, and a target substrate 141 fixed to the target substrate ~~holder~~ holder 140 is irradiated with the selected ions.

Please replace paragraph [0052] with the following amended paragraph:

[0052] As described above, according to the first embodiment, the plasma containing the predetermined ions is generated by the arc discharge ion source 5 and, when the ions are extracted from the plasma to the outside of the source chamber 3 with the predetermined ion extraction energy, the magnetic field is formed along the ion extraction direction by the solenoid coil 6. Accordingly, the ion extraction from the ion source 5 is promoted without bending of the extracted ions by the magnetic field, and the ion beam current can be maintained at a high level. By irradiating the target

substrate 141 with the extracted ions through the ion mass selector 130, it is possible to carry out ion implantation with sufficiently high throughput even in the case of ions with a mass number 20 or lower, and/or ions with extraction energy 10 keV or lower (further, 1 keV or lower).

Please replace paragraph [0073] with the following amended paragraph:

[0073] In the Off-ECR mode, the microwave frequency and the magnetic field intensity are preferably set so that the microwave frequency ω becomes higher (or lower) by 10 to 50% (more preferably 20 to 40%) than electron cyclotron frequency ω_e . Accordingly, for example, if a microwave of 2.45 GHz is used, preferred magnetic field intensity is 96 to 131 mT or 44 to 79 mT (more preferably, 105 to 123 mT or 53 to 70 mT). If a microwave of 14.5 GHz is used, preferred magnetic intensity is 570 to 777 mT or 259 to 466 mT.